REMARKS

Reconsideration is requested.

In this response, claim 65 has been amended to correct a typographical error. Claims 1-34, 36-50, 53-65, 67, 68 and 71 are pending in this application.

Claims 1-4, 9, 11-12, 14, 16-20, 25, 27-28, 30, 32-34, 36, 41, 43-44, 46, 48-50, 57, 59 and 61-63 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,611,825 to Billheimer.

Claims 5, 15, 21, 31, 37, 47, 53, 60, 65, 67-68 and 71 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,611,825 to Billheimer in view of U.S. Patent No. 6,289,353 to Hazlehurst.

Claims 6-8, 22-24, 38-40 and 54-56 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,611,825 to Billheimer.

Claims 10, 13, 26, 29, 42, 45, 58 and 64 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,611,825 to Billheimer in view of U.S. Patent No. 5,897,627 to Leivian.

Rejection of claims 1-4, 9, 11-12, 14, 16-20, 25, 27-28, 30, 32-34, 36, 41, 43-44, 46, 48-50, 57, 59 and 61-63 under 35 U.S.C. §102(e) as being anticipated by Billheimer is respectfully traversed.

Claim 1 recites, in part, a multi-query data visualization process comprising determining relative relationships between each of the plurality of query objects and the items of the body of data, and displaying points along a plurality of rays, wherein a position of each of the displayed points corresponds to the determined relative relationship between each respective one of the

plurality of query objects and the body of data, wherein a ray is provided for each query object, and wherein displaying includes displaying a point representing a specific one of the items at a first position along one of the rays, which position indicates a determined relative relationship between the item and the ray's query object, and displaying a second point representing the same specific item at a second position along another one of the rays, which second position indicates a determined relative relationship between the item and the second ray's query object.

Support for the terms "ray" and "points" can be found on page 9, lines 1-12 of the present specification.

Anticipation of a claim under §102 can be found only if the prior art reference discloses every element of the claim.

Billheimer fails to teach or suggest a multi-query data visualization process as defined by applicants' claims.

The Office Action asserts that Billheimer's col. 14, lines 10-14 disclose "identifying features within each of the plurality of query objects that allow comparison to items of a body of data stored in the database" as recited in claim 1. Applicants respectfully disagree in view of the following:

Billheimer discloses a method and a system for representing a document collection using a subspace projection based on the distribution of the occurrence of terms in the documents of the document collection. Billheimer fails to teach or suggest identifying features within each of the plurality of query objects that allow comparison to items of a body of data stored in the database.

Billheimer's Fig. 9 and col. 10, lines 10-14 and 20-25 disclose "once the document collection is represented in the subspace, a query can be treated as a document, and projected into the same subspace. The distance between the query and other documents are measured to determine the best matches (i.e., the nearest documents)...and that a query frequency vector is computed by tokenizing the query and applying the same term normalization and stemming policies that were used on the original collection."

The above recited portions of Billheimer merely disclose identifying documents that are nearest to a query. Billheimer, at the most, appears to disclose single query processing. Billheimer fails to teach or suggest "identifying features within each of the plurality of query objects that allow comparison to items of a body of data stored in a database" as recited in claim 1.

Further, Billheimer fails to teach or suggest "determining relative relationships between each of the plurality of query objects and the items of the body of data" as recited in claim 1. The Office Action asserts that Billheimer's col. 14, lines 28-31 discloses such. Applicants disagree in view of the following:

Billheimer's col. 14, lines 28-33 discloses "...the similarity is determined by measuring the distance between the query and the documents, for example, using the cosine. The top ranked documents (in terms of closeness) are returned as best matches to the query. The logic then ends...." This disclosure suggests determining similarity by measuring the distance between the query and the documents to retrieve top ranked documents that best match the query.

How does this disclosure perform "determining relative relationships between each of the plurality of query objects and the items of the body of data" as recited in claim 1? How does retrieving top ranked documents relate to "determining relative relationships between each of the plurality of query objects and the items of the body of data"? In the claimed invention, relative relationships between each of the plurality of query objects and the items of the body of data are determined for collective interpretation of results from a plurality of query objects. Billheimer is not even remotely related to multi-query data visualization. Therefore, the question of determining relative relationships between each of the plurality of query objects and the items of the body of data does not arise.

Finally, the Office Action incorrectly asserts that Billheimer's col. 18, lines 11-27 and Figure 20 disclose "displaying points along a plurality of rays, wherein a position of each of the displayed points corresponds to the determined relative relationship between each respective one of the plurality of query objects and the body of data, wherein a ray is provided for each query object, and wherein displaying includes displaying a point representing a **specific one of the items at a first position along one of the rays**, which position indicates a determined relative relationship between the item and the ray's query object, and displaying a second point representing the **same specific item at a second position along another one of the rays**, which second position indicates a determined relative relationship between the item and the second ray's query object." (Emphasis Added)

Billheimer's Figure 20 discloses a scatterplot diagram. The three-dimensional scatterplot visualization is constructed by prompting the user to enter a term or set of terms for each axis to be used in the construction of the scatterplot. "Module," "fuselage," and "pounds" are the terms that the user may enter to create the scatterplot. Where does Fig. 20 display <u>a point</u> representing a specific one of the items at a first position along one of the rays, and displaying the <u>same specific item at a second position</u> along another one of the rays?

Billheimer's Fig. 20 fails to teach or suggest "...wherein displaying includes displaying a point representing a **specific one of the items at a first position along one of the rays**, which position indicates a determined relative relationship between the item and the ray's query object, and displaying a second point representing the **same specific item at a second position along another one of the rays**, which second position indicates a determined relative relationship between the item and the second ray's query object" as recited in claim 1.

In view of the above, as Billheimer fails to identically teach every element of claim 1, it does not anticipate claim 1.

Therefore, claim 1 is allowable.

As claims 2-16 depend on claim 1, they too are not anticipated by the Billheimer reference.

Claims 5, 15, 21, 31, 37, 47, 53, 60, 65, 67-68 and 71 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer in view of Hazlehurst.

Claim 5 depends from claim 1 and distinguishes over Billheimer for the reasons set forth above. Hazlehurst fails to cure Billheimer's deficiencies noted with regard to claim 1. Claim 5 further presents additional patentable subject matter. Claim 5 recites "locating the plurality of rays to have a common origin and further comprising determining a critical distance from the common origin, wherein points on the plurality of rays falling within the critical distance meet or exceed a relevancy threshold and points on the plurality of rays outside the critical distance do not meet the relevancy threshold."

Billheimer fails to teach or suggest a plurality of rays as recited in claim 1. Thus, a subsequent determination of a critical distance of points from the common origin does not arise. The Office Action incorrectly asserts that Billheimer teaches determining a critical distance from the common origin. Billheimer's Fig. 20, col. 15, lines 52 - col. 16, line 3, and col. 17, lines 25-41 fail to teach or suggest "determining a critical distance from the common origin" of claim 5. For example, Billheimer's Fig. 20 and its corresponding disclosure are not relevant to determining a critical distance from the common origin. It discloses a procedure for generating legends from the axes shown in Billheimer's Fig. 11 - the legends being obtained by identifying a column in the term frequency matrix that represents a desired dimension.

Hazlehurst relates to accessing information and categorizing users using an adaptive and scalable indexing scheme. It does not relate to visualizing the results of multiple queries to a search engine. Hazlehurst's col. 21, lines 28-50 relate to a step diagram for processing of queries performed by a collator used

in an intelligent query engine system. It simply relates to query processing by collators.

Even if Hazlehurst could be combined with Billheimer, the combination would fail to teach or suggest displaying points along a plurality of rays, wherein points on the plurality of rays falling within the critical distance meet or exceed relevancy threshold and points on the plurality of rays outside the critical distance do not meet the relevancy threshold.

Therefore, claim 5 presents additional patentable subject matter.

Claim 15 is allowable for reasons similar to those provided above in connection with claim 1.

Claims 6-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer. Claims 6-8 are allowable for reasons similar to those provided above in connection with claim 1.

Claims 10 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer in view of U.S. Patent No. 5,897,627 to Leivian.

Leivian fails to cure Billheimer's deficiencies. For example, even if Leivian is combined with Billheimer, the combination fails to teach or suggest a multi-query data visualization process comprising determining relative relationships between each of the plurality of query objects and the items of the body of data, and displaying points along a plurality of rays, wherein a position of each of the displayed points corresponds to the determined relative relationship between each respective one of the plurality of query objects and the body of data, wherein a ray is provided for each query object, and wherein displaying includes

displaying a point representing a specific one of the items at a first position along one of the rays, which position indicates a determined relative relationship between the item and the ray's query object, and displaying a second point representing the same specific item at a second position along another one of the rays, which second position indicates a determined relative relationship between the item and the second ray's query object. Claims 10 and 13 are therefore allowable over the combination of Billheimer and Leivian.

Claim 17 is allowable at least for similar reasons set forth above with regard to claim 1.

As claims 18-32 depend on claim 17, they too are allowable.

Claims 26 and 29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer in view of Leivian. Leivian fails to cure Billheimer's deficiencies. Therefore, claims 26 and 29 are allowable.

Claims 21 and 31 stand rejected as being unpatentable over Billheimer in view of Hazlehurst. Neither Billheimer nor Hazlehurst teach or suggest identifying features within each of the plurality of query objects that allow comparison to items of a body of data stored in a database, determine relative relationships between each of the plurality of query objects and items of the body of data, and control the image device to depict points corresponding to data from the database along each of a plurality of rays, wherein positions of the displayed points correspond to the relative relationships, wherein a ray is provided for each query object, and wherein displaying includes displaying a point representing a specific one of the items at a first position along one of the

rays, which position indicates a determined relative relationship between the item and the ray's query object, and displaying <u>a second point representing the same specific item</u> at a second position along another one of the rays, which second position indicates a determined relative relationship between the item and the second ray's query object. (Emphasis Added). Accordingly, claims 21 and 31 are allowable.

Claims 22-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer. As claims 22-24 depend on claim 17, they too are allowable.

Claim 33 recites, in part, a computer-readable medium having computer usable code configured to cause digital processing circuit to determine relative relationships between each of the plurality of query objects and the body of data, and control an image device to depict points corresponding to data from the database along each of a plurality of rays, wherein positions of the displayed points correspond to the relative relationships, wherein the computer usable code configured to display includes computer usable code configured to display at least a majority of the plurality of rays to have a common origin.

Billheimer fails to teach or suggest "digital processing circuitry to determine relative relationships between each of the plurality of query objects and the body of data." It further fails to teach or suggest "digital processing circuitry to control an image device to depict points corresponding to data from the database along each of a plurality of rays, wherein positions of the displayed points correspond to the relative relationships, wherein the computer usable

code configured to display includes computer usable code configured to display at least a majority of the plurality of rays to have a common origin."

Therefore, claim 33 distinguishes over Billheimer.

As claims 34, 36-47 depend on claim 33, they too are allowable.

Claims 37 and 47 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Billheimer in view of Hazlehurst.

Hazlehurst fails to cure Billheimer's deficiencies as noted above with regard to claim 33. For example, even if Hazlehurst is combined with Billheimer, the combination fails to teach or suggest "digital processing circuitry to determine relative relationships between each of the plurality of query objects and the body of data." The combination further fails to teach or suggest "digital processing circuitry to control an image device to depict points corresponding to data from the database along each of a plurality of rays, wherein positions of the displayed points correspond to the relative relationships, wherein the computer usable code configured to display includes computer usable code configured to display at least a majority of the plurality of rays to have a common origin." Claims 37 and 47 which depend on claim 33 further limit the scope of claim 33 in a patentable sense.

Accordingly, claims 37 and 47 are allowable.

Claims 38-40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer. As claims 38-40 depend on claim 33, they too are allowable.

Claims 42 and 45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer in view of Leivian. Leivian fails to cure Billheimer's deficiencies with regard to claim 33. As claims 42 and 45 depend on claim 33, they too are allowable.

Claim 49 is allowable at least for similar reasons set forth above with regard to claim 33. Claim 49 further recites "the computer usable code configured to display the plurality of rays radiating outwardly from the common origin at equally-spaced angles from one another." Billheimer fails to teach or suggest this additional claim limitation. For example, Billheimer's Fig. 20 fails to teach or suggest a plurality of rays radiating outwardly from the common origin at equally-spaced angles from one another. It merely discloses a three-dimensional visualization of a selected top distribution in a document set. It has nothing to do with relative relationships between each of a plurality of objects and a body of data stored in a database as recited in claim 49.

As noted above, the term "ray," as defined by applicants' specification, refers to a geometric construct having an origin and a direction, and may correspond to a linear or non-linear construct, such as a spiral, or which may be a directed region of space or volume, such as a half-plane or a curved planar surface. The rays represent the possible variance in relative relationship between the plurality of query objects and the body of data. See page 9, lines 1-10 of the present specification.

In view of the above, claim 49 is patentably distinct over Billheimer. Claim 49 is therefore allowable.

As claims 50, 53-64 depend on claim 49, they too are allowable.

Claims 54-56 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer. As claims 54-56 depend on claim 49, they too are allowable.

Claims 53 and 60 stand rejected as being unpatentable over Billheimer in view of Hazlehurst. Hazlehurst fails to cure Billheimer's deficiencies as noted above with regard to claim 49. Claims 53 and 60 depend on claim 49 and further limit the scope of claim 49 in a patentable sense. Accordingly, claims 53 and 60 are allowable over the combination of Billheimer and Hazlehurst.

Claims 58 and 64 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Billheimer in view of Leivian. Leivian fails to cure Billheimer's deficiencies. Therefore, claims 58 and 64 are allowable.

Claim 65 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Billheimer in view of Hazlehurst.

Billheimer fails to teach or suggest "displaying a point along each of a plurality of rays for each of the plurality of query objects, wherein positions of the displayed points correspond to the relative relationships between a respective one of the plurality of query objects and the body of data, wherein displaying includes placing a small graphic entity at an end of each of the plurality of rays to represent a respective one of the plurality of query objects."

Billheimer also fails to teach or suggest "wherein displaying comprises displaying the plurality of rays to have a common origin and to radiate outwardly from the common origin at equally-spaced angles from one another."

Billheimer's Fig. 20 fails to teach or suggest a plurality of rays. Therefore, displaying of a point along each of the plurality of rays wherein the plurality of rays having a common origin and radiating outwardly from the common origin at equally-spaced angles from one another does not even arise.

\Hazlehurst fails to cure Billheimer's deficiencies. Even if Hazlehurst is combined with Billheimer, the combination would fail to provide "determining a critical distance from the common origin, wherein points on the plurality of rays falling within the critical distance meet or exceed a relevancy threshold and points on the plurality of rays

outside the critical distance do not meet the relevancy threshold."

Therefore, claim 65 is allowable. As claims 67, 68, and 71 depend on claim 65, they too are allowable.

In reviewing the initialed PTO-1449 Forms attached to the instant Office Action and the Office Action dated January 29, 2003, applicants note that copies of certain sheets of previously filed PTO-1449 Forms have not been initialed by the Examiner. To the extent that the submitted references listed on the PTO 1449 Forms attached to this response have not already been considered, such examination and initialing is requested at this time. A copy of the initialed PTO-1449 Forms to the undersigned is also requested.

Applicants herewith submit a duplicate copy of the following Information Disclosure Statement(s), and Supplemental Information Disclosure Statements, including PTO-1449 Forms for examination and initialing by the Examiner:

1) Information Disclosure Statement dated March 8, 2001, including 3 sheets of Form PTO-1449;

2) Supplemental Information Disclosure Statement dated April 12, 2001, including 2 sheets of Form PTO-1449;

3) Supplemental Information Disclosure Statement dated August 8, 2002, including 2 sheets of Form PTO-1449. Please note that Sheet 2 was not initialed, while only Sheet 1 of the Form PTO-1449 was initialed and included with the Office Action dated January 29, 2003;

4) Supplemental Information Disclosure Statement dated September 25, 2002, including 1 sheet of Form PTO-1449.

The Examiner is requested to telephone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time.

Respectfully submitted,

Dated: _Feb 23, 2004_   By: _____
                                              Deepak Malhotra
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